

AMENDMENTS TO THE DRAWINGS

Please replace sheet 3 of the drawings containing FIG. 4 with Replacement Sheet 3 enclosed herewith containing amended FIG. 4 wherein "53" has been corrected to --52--.

REMARKS

A Petition for a Two Month Extension is attached and charges the extension fee to applicant's attorney's deposit account number 23-0920. Please charge any additional fee required or credit any overpayment to deposit account 23-09020.

The Primary Examiner's objections to the drawings are believed to be overcome and rendered moot by the above amendments to the specification and to FIG. 4 of the drawings. Claims 1, 3-5, 10-13, 18 and 22-24 have been amended. Also new claims 25-36 have been added to distinctly claim subject matter which the applicant regards as his invention.

With respect to the Primary Examiner's comments regarding the deleted "s" in claim 1, claim 1 above reflects the previous amendments.

The Primary Examiner's objections to "non-oxygen containing gas" in the specification is believed to be overcome by the above amendments to the specification which now call for --non-oxidizing gas--.

The Primary Examiners rejections of the claims 1-6 10-14, 16, 18, and 22-24 under 35 U.S.C. §112 are believed to be overcome by the amendments to the claims set forth above. In particular, the language objected to by the Primary Examiner, "equally", "same" and "identical degree of polymerization" have been deleted from the claims. The terms --uniform-- and --generally constant--, as used in the specification are used also in the claims.

The Primary Examiner's rejections of claims 1-6 10-14, 16, 18, and 22-24 under 35 U.S.C. § 103 (a) for being unpatentable over the Young U.S. Patent No. 6,561,640, optionally in view of the Itou U.S. Patent No. 5,986,682 or the Malinen U. S. Patent No. 6,075,595 or the Owen et al. published U.S. Patent application No. 2005/0152146, as these rejections may be attempted to be applied to the amended claims, are respectfully traversed.

It is respectfully submitted that applicant's method and apparatus as now set forth in the amended claims fully distinguish over all the references of record.

The primary reference relied upon by the Primary Examiner is the Young U.S. Patent 6,561,640. Young teaches and shows an UV light emitting device sub-system 440 capable of separately irradiating each of a plurality of substances 432, 434, 436 and 438 with light having a wavelength that is in the range of wavelengths of ultraviolet light specific to that substance. Note, FIG. 4 shows that each substance is irradiated separately with a wavelength spectrum including a specific wavelength which is effective in curing the photo sensitive resin in one of the substances. This teaching of Young does not teach or suggest Applicant's placement of UV LED assemblies in alternate rows of staggered rows in an array of UV LED chips on a panel or interspersed in the staggered rows of UV LED chips on a panel as called for in claims 27 and 35.

Also, it is noted that, while Young teaches a method for curing substances and a substance curing system wherein ultraviolet light is directed onto an ultraviolet photosensitive resin, Young et al. does not teach a mechanism (comprising two eccentrically mounted cams, shafts and springs) for causing orbital, circular or elliptical movement of a panel mounting the staggered rows of UV LED chips, claims 5 and 16, as disclosed and claimed in the subject application.

It is noted that Itou is concerned with printing lottery tickets, bar code labels and other kinds of tickets where thermal sensitive paper is used and an image is optically fixed by heat and light using a heating board 10 and a light emitting board beneath the heating board 10 and mounting LED's in a staggered array as shown in FIG. 6.

With respect to Itou, applicant questions the asserted analogous nature of Itou and refers the Primary Examiner to the decision by the CAFC in the case of In re Clay, 23 USPQ 2d 1058 (Fed. Cir. 1992).

In In re Clay, supra., Clay's field of endeavor was "the displacement of liquid product from the dead volume of all underground fuel storage tank."

In In re Clay, supra., the CAFC stated that: "the art of gel treatment of underground formations to fill anomalies so as to improve flow profiles and sweep the efficiencies of injection and production fluids through a formation" (the field of endeavor of the patentee in the patent cited by the Examiner) cannot be considered to be within Clay's field of endeavor ("underground storage tanks") merely because both relate to the petroleum industry.

In the same manner, the field of "miniaturized recording apparatus for blocking off light in printing a bar code or ticket by optically fixing an image on a thermosensitive paper" cannot be considered to be within the field of endeavor of "a curing apparatus for applying UV light to UV photo initiators in UV curable inks, coatings, or adhesives on products" merely because both relate to applying light to a substrate.

See also the decision by the CAFC in the case of In re Oetiker, 24 USPQ 1 443, where Judge Newman, speaking for the court, stated:

"In order to rely on a reference as a basis for rejection of the applicant's invention, the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. See In re Deminski, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986). Patent examination is necessarily conducted by hindsight, with complete knowledge of the applicant's invention, and the courts have recognized the subjective aspects of determining whether an inventor would reasonably be motivated to go to the field in which the examiner found the reference, in order to solve the problem confronting the inventor. We have reminded ourselves and the PTO that it is necessary to consider "the reality of the circumstances", In re Wood, 559 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979) - in other words, common sense - in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.

"It has not been shown that a person of ordinary skill, seeking to solve a problem of fastening a hose clamp, would reasonably be expected or motivated to look to fasteners for garments. The combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a **prima facie** case of obviousness. There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge can not come from the applicant's invention itself."

In determining the applicability of a prior art reference cited, one looks first at the problem that is presented to one skilled in the art and then makes a

determination of whether or not a reference is from analogous art. This is a two fold step.

In In re Wood, 202 USPQ 171:

"First we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved."

The next step in determining the applicability of the prior art reference, i.e., whether or not it is analogous or non-analogous art, is stated in In re Horn, 203 USPQ 969, where the CCPA stated:

"For the teachings of a reference to be prior art under 35 U.S.C. §103, there must be some basis for concluding that the reference would have been considered by one skilled in the particular art working on the pertinent problem to which the invention pertains. For no matter what a reference teaches, it could not have rendered obvious anything 'at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains' unless a hypothetical person would have considered it."

Further with respect to the non-analogous nature of the Itou patent, it is to be noted that there is no presumption that one of ordinary skill in the art is familiar with all prior art. In this respect, reference is made to the decision by the CAFC stated in the case of Kimberly-Clark v. Johnson & Johnson, 223 USPQ 603, where the Court stated:

"We hereby declare the presumption that the inventor has knowledge of material prior art to be dead. What controls the patentability of the fruits of the inventor's labors are the statutory conditions of 'novelty, utility, and unobviousness' to a person having ordinary skill in the art to which said subject matter pertains, as stated in §103. It should be clear that that hypothetical person is not the inventor, but an imaginary being possessing 'ordinary skill in the art' created by Congress to provide a standard of patentability, a descendant of the 'ordinary mechanic acquainted with the business' of Hotchkiss v. Greenwood."

See also In re Heldt, 167 USPQ 676 and Ex Parte Murphy and Burford, 217 USPQ 479.

Further in this respect, the Primary Examiner's attention is directed to the decision in the case of Ex parte Dussaud, 7 USPQ 2d 1818, where the Board of Appeals found that one skilled in the art of diaper making would not look to the carpet manufacturing process and equipment field to solve a problem in the application of elastic to a web in a curvilinear pattern.

See also U.S. Surgical Corp. v. Hospital Products International, 9 USPQ 1241 (DC Con. 1988), where the Court found that the relevant prior art for determining the obviousness of a surgical stapler is not found in the art of paper staplers despite citation to such art during the prosecution of the plaintiff's surgical stapler patent application.

Still further, see In re Paqliaro, Franklin, and Gasser, 210 USPQ 888, where the Court found that a method for producing a decaffeinated vegetable material suitable for use in preparation of beverages was non-obvious from prior art disclosing conventional decaffeination processes combined with the teachings in reference (Aiello) discussing the lipoid theory of decaffeinated vegetable material suitable for use in preparation of beverages was non-obvious from prior art disclosing conventional decaffeination processes combined with the teachings in a reference (Aiello) discussing the lipoid theory of narcotics.

The Court found the Aiello reference to be non-analogous, since it was merely a treatise pointing out how the Meyer/Overton lipoid theory of narcotics was inaccurate because it was based upon experiments using an oil/water mixture and an oil/water mixture does not approximate the substances found in the human body. Thus, the Court found Aiello's disclosure not to be "within the field of the inventor's endeavor". Further, Aiello was not pertinent to the applicant's problem because he was not concerned with either beverage preparation or decaffeination of vegetable material.

See also In re Fritch, 23 USPQ 2d 1780 (Fed. Cir. 1992) where the CAFC stated:

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of

references can be combined *only* if there is some suggestion or incentive to do so.... The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification...."

For the forgoing reasons, applicant does not believe Itou is analogous art with respect to the teachings therein of a mechanism for reciprocating an array of light emitting devices and for the teaching of two rows of staggered light emitting devices.

The Malinen patent has been cited for its teaching of a temperature controller for controlling the temperature of LED's in an LED spectrometer used primarily for measurement of fat, albumin and water content of food stuff raw materials based on measuring the 800 to 1050nm transmission spectrum applied to the food stuff raw materials. It appears that the principal object of the Malinen patent is to control the wavelength of radiation produced by light emitting diodes and dispense the radiation in a predetermined wavelength spectrum and guide the radiation to an object under measurement. To this end, Malinen uses a Peltier element connected in thermally conductive fashion with a reflective base for cooling and/or heating the radiation source to provide constant wavelength spectrum of radiation.

While Malinen teaches controlling a wavelength transmission spectrum of radiation used to measure the contents of food stuff by the heating and cooling of a light emitting diode for the purpose of maintaining a constant wavelength spectrum and intensity of the radiation on the food stuff, Malinen has nothing to do with a UV curing method or apparatus as called for in amended claims 1 and 13.

Owen et al. is directed to a high intensity, solid-state, light source for various applications including photopolymerization. In this respect Owen et al. controls the temperature, through liquid cooling, of light emitting diodes to maintain a total power density output of light at a high level of at least 50mW/cm². Owen et al. teaches measuring the power density at a work surface.

While Malinen teaches temperature control of LED's for controlling wavelength spectrum and Owen et al teaches temperature control of LED's for maintaining a high light power output, neither of them teaches, individually or in combination with other references cited, the UV curing method and apparatus defined now even more clearly in amended claims 1 and 13 and including the steps of:

emitting UV light at a generally constant intensity and at a primary wavelength from staggered rows of UV LED chips mounted adjacent the printing head at a curing station so that the UV LED chips in one row are offset from all the UV LED chips in an adjacent row;

causing relative movement between the UV LED chips and the printed products, articles, or other objects; and.

uniformly applying, distributing or sweeping the UV light emitted from the UV LED chips so that the UV light uniformly irradiates the surfaces printed with the particular UV curable ink and facing the UV LED chips at the UV curing station to cure the particular UV curable ink on the products, articles, or other objects,

or

a controller operatively connected to said UV LED chips for controlling and maintaining the intensity of the UV light emitted from the UV LED chips at a generally constant level to uniformly apply and distribute UV light on the particular UV curable ink on the surfaces of the products, articles, or other objects facing the UV LED chips to uniformly cure the particular UV curable ink on surface of the product, article or other object facing the UV LED chips.

The Primary Examiner's rejections of claims 3 and 16, under 35 U.S.C. § 103 (a) for being unpatentable over the Young U.S. Patent No. 6,561,640, optionally in view of the Malinen U. S. Patent No. 6,075,595 or the Owen et al. published U.S. Patent application No. 2005/0152146, and further in view of the Itou U.S. Patent No. 5,986,682 or the Ignatius et al. U.S. Patent No. 5,278,432 or the Vackier et al. U.S. Patent No. 6,525,752, as these rejections may be attempted to be applied to the amended claims, are respectfully traversed.

Applicant has already dealt with Itou above and those comments also apply to applicant's claims 3 and 16.

The Ignatius et al. patent discloses an apparatus for providing radiant energy using LED's which emit monochromatic light having 620-680 nm wave length and/or 700-760 mn wave length which are particularly desirable for plant growth. Ignatius et al. illustrates in FIG. 1 LED's 14 which are staggered from one another.

The Vackier et al. patent is directed to an electrographic image reproducing

system such as a printer or copier which uses LED's. Vackier et al. shows in FIG. 1 staggered LED's arrays 14a and 14b which are parallel and spaced from a staggered plurality of discrete objectives 18a and 18b.

All three of references of Itou, Ignatius et al. and Vackier et al. are non-analogous art. While they show staggering of LED's or of LED arrays, they do not teach staggering of UV LED chips or assemblies in rows in a UV curing method or apparatus as disclosed and claimed by Applicant. Nor do they teach interspersing of two groups of UV LED assemblies or chips which emit UV light at different wavelengths in an array of staggered rows of UV LED chips or assemblies on a panel as set forth in claims 27 and 35. Nor do these references teach or suggest moving a panel containing the staggered rows of interspersed groups of UV LED chips or assemblies in a circular, orbital or elliptical path thereby to apply uniform light to UV curable materials on products as set forth in claims 5 and 36.

In support of this traverse of Itou, Ignatiüs et al. and Vackier et al., Applicant again refers the Primary Examiner to the decision by the CAFC in the case of In re Clay, 23 USPQ 2d 1058 (Fed. Cir. 1992), *supra*.

With respect to the new claims, support for claims 25, 26 27, 31 and 35 is found in the 5th and 6th full paragraphs on page 10. These claims cover the primary and secondary wavelengths of 415 nm and around 370 nm and the interspersing of the UV LED chips of different wavelength emissions in alternate rows or within the staggered rows. Support for new claims 28-30 and 32-34 is found in the 3rd full paragraph on page 1 and in the 6th full paragraph on page 11. These claims cover the use of shorter wavelength UV light to effect surface curing of ink in the presence of oxygen, and more specifically UV light from a germicidal lamp or UV light at 254 nm wavelength.

It is respectfully submitted that these new claims are patentably distinguishable over the references of record.

An earnest endeavor has been made to place this application in condition for allowance and an early and favorable action to that end is requested.

Respectfully submitted,
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